mm wide by about 3 mm long and are spaced about 1 mm apart in defined rows. The rows are preferably about 0.5 mm apart with the bond points in adjacent rows being slightly offset from one another in another in a staggered relationship.

It is believed that the utilization of the discontinuous fused borders 28, 30 reduces the generation of particulate matter upon the application of tension in the direction parallel to such borders by allowing the force to be spread more evenly through the matrix formed by the interstitial areas between the bond points 34, 36 thereby reducing the concentration of force which may lead to the localized breakage of fibers.

It is contemplated that load distribution may be further enhanced by pre-stressing the wiper 10 in the cross-machine direction prior to introduction of the discontinuous fused borders 28, 30. According to one potentially preferred practice, pre-stressing of the fabric may be carried out by stretching the fabric forming the wiper 10 during the introduction of the bond points 34, 36 thereby essentially locking in a stretched relationship. Such stretching may be carried out by use of a stretching frame or by other means as will be well known to those of skill in the art. Upon release of the fabric following the introduction of bond points 34, 36 a portion of the extension is relieved within the body of the wiper 10 but the bond points 34, 36 serve to substantially lock in stretch along the perimeter edges 14, 16.

As shown, the third and fourth perimeter edges 18, 20 extending in the machine direction preferably have a slightly different configuration. As best seen by simultaneous reference to FIGS. 1 and 2, the perimeter edges 18, 20

extending in the machine direction of the wiper 10 are preferably formed by folding the edges inwardly so as to form double layer borders 38, 40. Inboard of the double layer borders 38, 40 melt fused attachment zones 48, 50 are applied to thereby seal the double layer borders 38, 40 in place. As shown, according to one embodiment, the attachment zones 48, 50 may be made up of a pattern of fusion bond points 44, 46 formed by localized patterned melting of polyester or other thermoplastic fiber constituent in the manner described above. However, if desired, the attachment zones 48, 50 may also be in the form of solid melt fused strips extending inwardly from the inboard edge of the double layered borders 38, 40.

The double layer borders 38, 40 which are preferably smooth and substantially free of fusion bond points provide an edge structure which is not substantially susceptible to fiber fracture upon stretching and is thus believed to promote the integrity of the edges during stretching thereby reducing the generation of particulates. The attachment zones 48, 50 (whether solid or discontinuous in nature) are preferably broad enough such that a stable fusion bond relationship is established. By way of example only, and not limitation, in the event that the attachment zones are made up of discrete bond points 44, 46 as shown wherein the bond points 44, 46 are of a substantially rectangular configuration having a width in the range of about 0.75 mm and a length in the range of about 3 mm arranged in an off-set brick pattern in rows approximately 0.5 mm apart, it is contemplated that at least about 3 and more preferably about 4 or more such rows are utilized. Of course other geometries for the bond points 44, 46 as described above in the

relation to the fused borders 28, 30 extending in the cross-machine direction may also be utilized if desired.

As with the bond points 34, 36 extending along the cross-machine direction of the wiper 10, it is contemplated that the bond points 44, 46 disposed along the machine direction may be applied by use of any suitable patterned melt fusion device including by way of example only, and not limitation, an ultrasonic bonding apparatus using a rotating patterned anvil wheel or a patterned heat sink support used in conjunction with an ironing heat source.

According to one practice, it is contemplated that the formation of the wiper 10 may be carried out in a highly efficient and automated manner by continuously slitting an elongate web of fabric to yield multiple parallel strips of desired width. This cutting may be carried out using a laser or hot knife to seal the lateral edges. The strips are conveyed along a travel path through an edge folding apparatus at which a blade or paddle element is used to continuously fold the lateral edges of the strips so as to form the desired double layer borders 38, 40. The strips are thereafter passed through ultrasonic bonding stations arranged generally transverse to the travel path of the strips at which the bond points 44, 46 forming the fusion zones 48, 50 along the lateral perimeter edges are applied. By way of example only, it is contemplated that the ultrasonic bonding stations used to form the bond points 44,46 within the fusion zones 48, 50 may be generally similar to the device illustrated and described in U.S. patent 6,001,442 to Rockwell, Jr. (incorporated by reference) incorporating elongated horns and rail-like